

AMERICAN BEE JOURNAL.

PUBLISHED BY A. M. SPANGLER & CO., 25 NORTH SIXTH ST., PHILADELPHIA.

VOL. I.

APRIL, 1861.

No. 4.

The Dzierzon Theory.

BY THE BARON OF BERLEPSCH.

No. IV.

We shall proceed to consider the third proposition:

3. The queen possesses the ability to lay male or female eggs at pleasure, as the particular cells she is at any time supplying, may require.

After I had satisfied myself, by the experiments instituted in 1851, that normally the queen is the mother not only of the workers, but of the drones also, I became exceedingly anxious to see her supply drone-cells with eggs. I wished to obtain ocular demonstration of the fact. To this end, in the fall of 1851, having meantime examined properly constructed Dzierzon hives at Carlsmarket, I caused one to be made having a glass door in the rear, which could be covered. It was made of such width as to suit the combs of some of my old hives, and about the middle of October I selected sixteen combs, containing a sufficient winter supply of honey, but consisting of worker-cells exclusively. There was not a single drone-cell in any of these combs. I inserted and arranged them in two tiers, one above the other, and introduced into the hive a strong colony with a young queen. In the spring of 1852, I fed them lavishly with slightly diluted honey, two weeks before the rape came into blossom; and on the evening of the 12th of May, the bees began to *hang out* in clusters. On the 16th, I observed that on all the combs the cells not stored with honey were filled with brood. I now took out the first comb of the lower tier, facing the glass door, and inserted one containing chiefly drone-cells—there being only about 250

worker-cells in a portion of it. From the reverse side of this comb, which could not be seen when inserted in the hive, I had scraped off carefully all the cells from the foundation or middle partition, and cemented thereon instead, a comb of worker-cells, from one side of which, the cells had in like manner been removed. When this was placed in the hive, I could see all the drone-cells through the glass door. It was inserted at 3 o'clock, P. M., and was very soon covered with bees, which commenced cleansing the cells, and repairing such as had been broken or sustained injury. In the evening, when the bees had ceased to fly, those which clustered at the entrance were carefully brushed off, and the hive was removed to a dark room in my apiary. After we had again taken out all the combs, to assure ourselves by close inspection that all the cells were still empty, we commenced observations by the light of a small lamp with a movable shade. But in about forty-five minutes we were compelled to desist, because as the evening was very warm and sultry, the bees soon began to hang out in large clusters, and many of them, attracted by the light of the lamp, perished in the flame. We carried the hive back to its stand, took out the prepared comb, and substituted another for it. On the evening of the 17th, we reinserted the comb, and carried the hive to the dark chamber, having previously made such arrangements as to preclude the outlying bees from seeing the light of the lamp. Our observations could now be pursued more satisfactorily and without interruption—though after a busy day's work, the bees were fanning and humming loudly at the entrance. Some of the cells contained honey carried in on the preceding day, but it was not capped. The bees soon removed this, and we anxiously awaited the appearance of the queen. But greatly to our disappointment,

she failed to present herself, though we continued watching all night. At five next morning, when the bees in the apiary had already begun to fly, we once more replaced the hive on its stand, and removed the prepared comb. On the evening of the 18th we re-commenced observing, I engaging to watch from nine o'clock to eleven. Before ten o'clock the queen made her appearance, and remained inactive about five minutes, whilst the workers were bestowing on her their usual caresses and attentions. She then proceeded to inspect a cell, by inserting her head in it, and immediately commenced laying. I had aroused my attendant, Günther, from his nap, as soon as her majesty presented herself on the comb, and we were delighted to behold *the queen of an unquestionably normal hive lay eggs in drone-cells*. To enable ourselves to witness this act, was the sole design of the experiment, and therein we were completely successful. But we were perfectly astounded to see, when the queen came to the worker-cells, that instead of passing them by, as we anticipated she would, she proceeded without hesitation to supply them likewise regularly, cell after cell. "Oh, that Dzierzon were here!" exclaimed Günther. "Nay," said I, "not Dzierzon, but Busch, the champion of the drone-mother theory—he should be here!" Five times did the queen change her position, passing from drone to worker-cells, and from worker to drone-cells, continuing to lay till after one o'clock, with occasional intermissions—once for nearly twelve minutes. When it appeared that she was about to leave the obverse side of the comb, I opened the glass door, caught her, confined her in a cage, brushed the bees from the comb with a feather, and counted the eggs. We found 204 in drone-cells, and 28 in worker-cells. I now removed the prepared comb and substituted an empty drone-comb, to ascertain whether any eggs would be laid *in the absence of the queen*. None were laid, and on the evening of the 20th, I found the cells were filled with honey. On the 27th, the cells having been capped, I removed the comb and inserted another empty drone-comb instead. On the 16th of June, when I took out and examined all the combs, I found the drone-comb still empty—containing neither eggs, brood, nor honey. On the 26th of May, a tremendous and devastating hailstorm had destroyed the crops in all the region round, and entirely deprived the bees of pasturage.

In the course of these observations, I discovered what I will here mention incidentally, that bees, when in want of drone-cells, know how to provide a supply for themselves. On portions of several combs, they had evidently demolished the worker-

cells, and built drone-cells instead, numbering altogether 68, in which, manifestly, from their appearance, drones had been bred; and I also saw several drones, when brushing the bees from the combs. How suggestive is this fact. Does it not point out clearly the expediency and advantage of restricting and repressing the production of drone-comb, in the brooding apartment of a hive, and of removing therefrom all it contains of such comb?

On the 18th of May, I inserted the prepared comb which contained the worker and drone-eggs laid by this queen, in a hive from which a swarm had issued on the preceding day. On the 8th of June, I took it out and saw in the cells, perfectly developed workers and drone nearly mature.

By this experiment, (which I would suggest that other inquirers also should try, and which I have so minutely detailed to enable others to devise improvements,) it is incontestibly proven, that in the normal condition of a colony, the queen not only lays all the drone-eggs, but—what is of still greater importance—that she is able to lay male or female-eggs *interchangeably, at pleasure*. Will others now continue to pronounce the Dzierzon theory, as to this point, incongruous and absurd? Possibly they may, for even at the Arnstadt Apian Convention, the mythical drone-mothers found some devoted champions. Be it so—since every one has it in his power to satisfy himself of the truth, or not, as he pleases—just as the queen may lay male or female-eggs, as she chooses!

The fourth proposition of the Dzierzon theory is:

4. In order to become qualified to lay *both* male and female-eggs, the queen must be fecundated by a drone or male bee.

The correctness of this proposition is now admitted by so large a majority of intelligent apiarians, that I might almost say it is universally conceded. A small number only, still regard it as doubtful or continue to controvert it, because hitherto they have not been able to satisfy themselves that the drones are males. Formerly, I also refused to receive the doctrine, as it appeared to me to be contrary to all analogy, that such clumsy, awkward, sluggish creatures as the drones, so palpably subordinated to the workers, should belong to the male sex. To determine the facts and ascertain the truth, I instituted numerous and most diversified experiments, which involved the total destruction of twenty-three colonies, and the partial ruin of at least as many more. But the result was, that I obtained clear and conclusive evidence of the virility of the drones, and of the purpose of their existence. Permit me to describe in detail,

some of the more important of these experiments.

I began in the fall of 1837, after all the drones had disappeared, by removing the queens from two of my colonies. As these colonies were at my late residence, Seebach, and I then held the office of Referendary at Mühlpausen, I found that I could not prosecute my observations with the requisite attention, and was constrained to defer them till the ensuing spring. In March, 1838, I found that neither of these colonies contained brood, though each had reared and still retained a queen. So likewise the young queen reared in a colony, from which the old one was removed in that month, laid no eggs.

On the 6th and 7th of March, 1843, having returned to reside at Seebach, and established an apiary there of about one hundred colonies, I removed the queens from six of them. Four of these reared young queens, and two remained queenless. No eggs were laid in any.

In June, 1844, I placed three second-swarm colonies at my mill, situated about two miles from Seebach, having previously removed from them all their drones. In two of them no eggs were laid, but I found some in the third. This staggered me for the moment, and I took up the notion, suggested by others, that queens were susceptible of fecundation only at the most genial season of the year. Yet I could not, on the other hand, account satisfactorily for the diverse results obtained. I came to the conclusion finally, that the location of the mill was not sufficiently remote from the nearest apiary to preclude all intercourse between the queens and drones.

I now endeavored to find a locality within the circuit of a league from which no apiary existed and no bees were kept. My researches were fruitless; I could discover no such spot, unless it were in the recesses and seclusion of a distant forest. Even in that by-place it was possible some wild bees might harbor. Inquiring of the forester who had charge of the district, and of the woodchoppers who were employed there, whether they knew of any wild bees within the designated bounds, or had ever heard of any being observed there, I was answered in the negative. The forester said it was reported in former times bees had occasionally been found, but that after all the old and decaying timber was removed, they had disappeared. I then offered the woodchoppers a reward of five dollars for every colony of wild bees they might discover within certain limits; but no one came forward to claim the reward. Thereupon I concluded to make the forest the scene of my experiments. On the 27th of June, 1845, I immersed three second-swarms in a bath,

removed all the drones from each, hived the bees again, and transported them by night to the spot which I had selected. This was about three leagues from Seebach, and there I concealed the hives carefully in a dense thicket. Besides myself, my overseer, and a faithful old servant who carried the hives, not a soul knew aught of my proceedings. On the 1st of August, having in the meantime repeatedly visited them alone and in secret, I had the hives carried back to Seebach. No brood was found in either on examination, but each contained a vigorous queen. In 1846, the experiment was repeated, with like results. After the lapse of four weeks, two of the colonies contained no brood. The third had deserted its hive.

These experiments fully convinced me that in the absence of drones, no queen could be fecundated, and that the drones are males, the only males in the colony. I did not subsequently repeat the experiments to establish the virility of the drones; nor shall I do so hereafter. I consider the fact as already empirically demonstrated, and the question definitively settled. It is true, Capt. Balenstein's experiments led him to a different conclusion. But I cannot hesitate to believe that there was, unknown to him, a colony of domestic bees at some point within a short distance of the Italian colonies with which he experimented.

I must also add that, as I distinctly remember, in my earlier experiments many of my experimental colonies produced drones. But I was then still a firm believer of the doctrine that drone-mothers are regular and essential members of the commonwealth of bees, and the production of drones in colonies of any description, never so excited surprise or suspicion as to induce me to note the circumstances under which it occurred in my bee diary.

Let us now consider the proposition next in order:

5. The fecundation of the queen is always effected outside of the hive, in the open air, and while on the wing. Consequently, in order to become *fully* fertile, that is, capable of laying *both* male and female eggs, the queen must leave her hive at least once.

He who doubts or denies the regular hymeneal excursions of the young queens, which Janscha first observed, should place a second swarm in some isolated locality, and watch it closely when the bees are disporting, at or about noon, in fair mild weather. By vigilant and persevering attention, he will then certainly see the queen issue, take wing, and return—unless she be unfortunate

while away. I have witnessed this in numerous instances. These excursions alone plainly indicate that fecundation is accomplished outside of the hive. But it is clearly proven by the well known fact that virgin queens with crippled wings, or whose wings have been designedly clipped, never become capable of laying *worker* eggs. On the other hand, the wings of a fecundated queen may be clipped, without detriment to her capacity to lay *both* kinds of eggs. I have clipped the wings of eight or ten second-swarm queens just emerged from the royal cells, and not one of them ever laid *worker* eggs.

I would suggest to those who desire to make such experiments, to place the hives level with the ground; otherwise the queen, unable to fly, would be lost. In her efforts to take wing, she falls to the ground, and cannot regain her hive. But if the hive is level with the ground, she will generally crawl back. This also enables one to witness her singular gymnastics in front of the hive, which are sometimes quite ludicrous—especially when only one wing has been clipped.

The invariable inability to lay *worker* eggs, characterising young queens which are, from any cause, incapable of flying, is proof manifest that fecundation is accomplished only outside of the hive, and never within it. This, I think, must be conceded, or will be by those who carefully make the experiments I have suggested.

As for the twin doctrines, that queens are born fertile and do not need fecundation, but only require exercise in the open air to set their ovaries in action; or that the observed excursions take place only after copulation within the hive, and are mere pleasure jaunts; they are too futile to require serious notice—being mere fanciful conjectures, without a shadow of proof or even plausibility.

It is "a fixed fact" that fecundation is accomplished outside of the hive; and this in every instance, without exception. Hence, it is indispensable that the queen must leave her hive "at least once," though repeated excursions may be required. Scarcely one in a hundred becomes fertile after leaving for the first time. Before taking wing on the first occasion, she will generally crawl about on the alighting-board and on the front of the hive, and then hover about awhile with her head turned towards it, alternately receding and returning, evidently noting its form and appearance, and marking its locality ere she takes her departure, so as to be able to find it readily on her return. Nor does she usually remain absent long on this her trial trip, returning to, and approaching the hive as warily, and with as many

precautions as when she left it. Even on the second occasion, she still displays hesitation and anxiety; but subsequently she goes and comes with the readiness and freedom of a veteran worker. Generally the young queen leaves for the first time, while the bees are most busily disporting in front of the hive, as though instinctively conscious that that was the most opportune time. We seldom see one issue before twelve o'clock or noon, or after four o'clock, P. M. While she is preparing to leave, the workers pay her hardly any attention, neither feeding nor fondling her; and the drones seem unconcerned and frigid. She commonly begins to make her excursions on the third day after leaving her cell; unless the hive contains other queens, nearly mature, in royal cells. In such cases, the excursions are deferred till all the rivals have been dispatched or removed.

It is evident that copulation takes place in the air, and while both parties are on the wing. A healthy drone is never seen to alight anywhere, except at the entrance of his hive; and queens, when making their hymeneal excursions, always direct their flight upward, and vanish from view at a high elevation. *A priori* evidence of the necessity of this, is moreover furnished by the physical organization of the drone.

POLLEN MITES.

If comb containing pollen be placed in a damp situation, it soon becomes mouldy; but if put in a very dry place, such as a warm chamber, the pollen will speedily be infested with mites. To the naked eye, the surface of the pollen then assumes the appearance of being dusted over with fine meal. Place some such pollen under the microscope, and it will be found to contain thousands of exceedingly minute *mites*, evidently feasting on the pollen. I sent some such comb to Prof. Leuckart for examination, and he informed me that the mites were a species of *acar*us, resembling the common cheese-mite more than any other kind of which he has any knowledge; and that its identity with some other species, might be ascertained by placing it on cheese, mould, &c. I tested them, accordingly, on bread, meal, and cheese; but the mites did not multiply, though I tried the experiment repeatedly. But when placed on pollen, they invariably produced an innumerable progeny in the course of a few weeks. This leads me to believe that the pollen-mite is a peculiar species, not heretofore noticed or described.—DOXHOFF.

—Please send us the names of beekeepers.

[For the "Bee Journal."]

Societies and Clubs.

Among the means employed in Germany for the encouragement and extension of bee-culture, one of the most important and efficient is the organization of Apian Societies wherein practicable. Such societies now exist and are operating beneficially in a great number of districts. They have served to excite interest, to combine action, and to concentrate effort. By them, information is collected and diffused. Under their supervision reliable practical treatises on the management of bees have been prepared or procured, and furnished to members and others, at low prices. They have made special exertions to introduce properly constructed improved hives, and employ competent persons to teach the mode of using them in accordance with the most approved modern practice.

The result of these organized systematic operations, has been highly gratifying and flattering. Old and deep-rooted prejudices have, to a large extent, been eradicated from the popular mind, in the sections in which the more energetic of these societies are located. There, apiculture presents itself in a new aspect altogether; and being grounded on a thoroughly digested theory, is not likely ever to retrograde. Success and the resulting profit have given it stability, and must conduce to regular growth and extension.

The larger of these societies, embracing wider bounds, increase their efficiency by establishing branches or affiliated associations, composed of beekeepers who reside near each other, and can conveniently meet for frequent consultation and discussion. Many of these clubs do not number more than eight or ten members; but the aid and countenance extended to them by the parent society, supports their zeal, invigorates their action, and gives direction to their efforts. Thus, by combination and ramification, the influence of the central body is made to reach even the smallest hamlets and most secluded districts.

Union, Ohio.

J. STAHL.

(For the "Bee Journal.")

I would inquire of the correspondents of the "Bee Journal," if part of a comb in a hive becomes mouldy, whether that comb should be taken out? We had several hives in a cellar, and the back combs of one that stood near the wall, became mouldy.

Norristown, Pa.

W. H. McC.

The beekeepers of Naples call foul-brood *muffee*, (mould.)


(For the "Bee Journal.")


I have two or three swarms of bees that are in a bad condition at this time. I have wintered stocks in a dry cellar, with perfect success; but this winter I don't know but I have failed. The swarms I speak of are in movable frames; and others that are in box-hives are in good condition, to all appearance. These two have a kind of dysentery, as I call it. Now what is the cause of it? A great many bees have died, and there is a very bad scent arising from them. I have removed them from the cellars; but it is so cold here, it will not do to set them out at present—the snow being nearly two feet deep on the ground.


This is not a very good place for beekeeping. I have used the box hive with good success, with boxes on top for surplus honey. Some seasons I get from 25 to 30 lbs. of honey from a swarm. Generally young stocks swarm two or three times here. I have another kind of hive in use, with four boxes, two large and two small ones. Bottom boxes thirteen inches square by seven and a half inches high, in the clear. The small ones hold about 16 lbs. each. By shifting boxes I can move them strong or weak, with very good success. The boxes are above one another, with passages or spaces for the bees half an inch wide.

South Sutton, N. H.

W. H. S.

 The dysentery and consequent mortality, in the above case, were probably caused by the want of sufficient upward ventilation in the hives used. When bees in movable comb hives, are wintered in a dark cellar, the honey-boards should be altogether removed, and not replaced till towards the approach of spring, when the bees begin to have brood to nurse. If the cellar is a very dry one, a piece of sponge containing clean soft water should be laid in the frames immediately over the cluster, and occasionally examined and replenished if necessary. Excessive condensation of moisture within the hive, in winter, is always troublesome and frequently fatal to the bees. It is the great obstacle to safe out-door wintering of stocks in common hives; but can easily be overcome in movable comb-hives, by elevating or entirely removing the honey-board.

 In a favorable year, an acre of buckwheat in blossom can furnish 25 lbs. of honey daily; and a strong stock of bees, not having over a half mile to fly, can carry in from six to eight pounds a day.

 Is it a fact that first swarms generally issue in the forenoon, and second swarms in the afternoon?

Meal Feeding.

BY THE REV. MR. SCHOLZ.

If the weather is fair and mild, sometime before the earliest hazel or willow catkins make their appearance, and the bees have yet no opportunity to gather pollen, it is advantageous to offer them rye or oat meal as a substitute, of which they will eagerly avail themselves. The meal may be lightly shaken into the cells of old drone comb or put in a shallow box, and set in some sheltered place twenty or thirty paces from the hives or apiary. If offered to them in a box, it should have some short pieces of clean dry straw strewed over it, on which they may alight and form their pellets.

The feeding of meal, at this period, enables the beekeeper to ascertain pretty accurately whether his stocks are in a healthy condition. If the bees of any hive fly briskly, forming and carrying in large plump pellets of meal, he may fairly conclude that they have a vigorous and fertile queen, with plenty of brood to nurse. But a hive whose bees fly languidly and form small, thin, threadlike, and imperfect pellets, is either weak, diseased, or queenless, or has an old and feeble queen and very little brood.

To aid the bees in forming pellets, it is well to place near the meal, a shallow vessel containing sugar-water, into which some small lumps of wax have been dropped. To this they will occasionally resort, using the water to dampen the meal slightly when making up their pellets. To avoid the risk of inciting robbery, the feeding and water vessels should not be placed nearer to the hive or apiary than is advised above.

To keep bees at home during rough and cold weather in the early spring, when they could at any rate gather very little abroad, it is advisable to prepare the following mixture for them:

Take two parts of meal, two parts of pulverized sugar and one part honey somewhat diluted with water, so that the whole may be kneaded to a pretty stiff dough. Put this in a narrow sack of coarse linen from which every third thread of warp and woof has been drawn out, so that the contents of the sack may be easily accessible to the bees. Tie up the sack, and dip it in a pot of hot water, withdrawing instantly. Then flatten it out and lay it on the frames of movable comb hives, directly over the place where the mass of the bees are clustered. The honey-board should have a hole cut through it, suited to the size of the sack, and over this a small tight box should be inverted, to prevent the escape of heat from the interior of the

hive. The bees will gradually appropriate the food thus offered to them, which contains in an acceptable form the substance of the pollen they need. They will thus be kept from needlessly exposing themselves by venturing forth, at an inclement season, in search of that which nature does not yet furnish in abundance. If the colony is weak and also needs feeding, the sack when emptied, should be filled again in like manner, and replaced.

The same method of supplying them may be used with common box or straw hives, by cutting a hole of sufficient size in the top, placing the sack therein, and covering it with a close fitting box inverted over it.

It not unfrequently happens in spring, while the fruit trees are in blossom, and when the bees already have much brood to nurse, that a spell of raw, wet weather occurs, continuing for days and at times for weeks. If bees at such periods venture forth, they may often be found benumbed on the flowers or blossoms they have visited, or lying chilled on the ground in front of their hives, having been unable to reach the entrance. Their urgent need of pollen and water, at such times, impels them to venture out and encounter the hazards of the weather. These losses may to a considerable extent be avoided, by feeding them exclusively in the evening with a mixture of two parts meal, one part finely-pulverized potato starch, two parts pulverized sugar, and one part honey diluted with hot water. The meal and starch must be stirred in cold water to a thin and smooth paste, before the hot diluted honey and the sugar are added, that the mixture may not become lumpy. When this has cooled sufficiently to be barely lukewarm, take out a frame with empty comb, (if the bees are in a movable comb hive), pour the liquid food in the cells and return the frame, placing it as near as practicable to the combs containing the brood. If the mixture gets too cold to flow readily, add a little hot water and stir the mass well.—In common hives, the food thus prepared may be placed *under* the brood combs, in a shallow dish or feeding-trough, covering it with a perforated float. The bees will eagerly avail themselves of this resource; but it must be accessible to them only in the evening or at night, or they will be impelled to fly however unfavorable the weather may be. If fed during the day in common hives, strange bees would moreover be very likely to be attracted by the odor of the food, and robbing be thus induced.

If rye or oat meal cannot conveniently be procured, wheat flour will answer as a substitute.

But oat meal, as containing a greater propor-

tion of saccharine matter, is probably the best that can be used, and will be decidedly preferred by the bees.

The feeding of meal effects a considerable saving of honey, which would else be expended on the brood. Vast numbers of bees are likewise preserved by this process. Having within reach ample supplies of this excellent substitute for natural pollen, they remain contentedly at home, and thus escape the dangers to which they are exposed, if required to go abroad in quest of what they need.

It has been ascertained that when the weather is favorable and the bees are fed in the open air, a strong colony will carry in about three pounds of meal, before the catkins and blossoms become available. But when these latter can be resorted to, the meal-troughs or boxes are immediately forsaken—the natural product being preferred to all artificial substitutes.

GRAPE SUGAR.

Grape sugar is now extensively manufactured in some of the cities on the Rhine, for the purpose of *gallicising* the wines of that region. The use of it for feeding bees has latterly been recommended; and I procured thirty pounds of it last season to test its value. The result induces me to think that it may be resorted to with decided advantage, when it becomes necessary to feed bees; and for the following reasons:

1. Grape sugar can be obtained at a much lower price than cane sugar.
2. While it is equally as nutritious as cane sugar, it is naturally better adapted to the constitution of bees, as it forms the chief ingredient of honey—being commonly called honey sugar.

I fed it dissolved in barley water, and also in its raw state, as it comes from the factory, only slightly moistened with water. In this latter state bees consume it slowly, without such waste as occurs when feeding candy; wherefore, I regard it as better and more economical than that article, for winter food.—DÖNHOF.

C. F. DIETERICH states in the German *Bienenzeitung*, that he saw Italian bees gathering honey from the blossoms of red clover, in the summer of 1858; but as the season was a very dry one, he thinks the heads were somewhat smaller than usual. He, moreover, found them frequently on flowers which are generally visited by humble bees only; and thence conjectured that the Italian bees have a longer proboscis than the common kind.

BEE LAW IN FRANCE.

Civil Code, Art. 524.

1. The owner of a swarm of bees has the right to pursue and reclaim it, provided he follows it when it issues from the hive and leaves his premises; otherwise it belongs to the proprietor of the ground or property, to which it resorts and clusters.
2. A swarm discovered flying in the air, and not yet pursued by any one, belongs to him who first sees and pursues it.
3. Stocks of bees are exempt from taxation, and are not subject to levy, execution, or sale for taxes, imposts, or duties, or for debts or liabilities of any kind whatever.
4. Bees are not to be disturbed or annoyed, but must be allowed to carry on their operations in peace, with liberty to fly and forage where they please. The removal or transportation of stocks from one place to another, is permitted only in the months of December, January and February.
5. When a beekeeper sees that a swarm is issuing from one of his hives, he is bound to announce the fact to his neighbors and others, by making an outcry or noise; and he must immediately follow and secure the swarm, if it leaves his own premises. But in so doing, he is not permitted to scale walls, or break down fences. If he causes any damage when securing, hiving, or recovering his swarm, he is bound to make satisfactory compensation to the injured party, before he removes the swarm.
6. Stocks of bees purchased by the owner of real estate, to be used in practical bee culture on his premises, are to be regarded and treated as fixtures belonging to the property. If the real estate be sold without an express reservation of the stocks, in the conditions of sale, they belong to the purchaser, and cannot be removed without his consent.

Special occasions or occurrences sometimes come opportunely, to induce us to re-discuss practical subjects; because, when topics have been thoroughly investigated by us, and definitely settled in our own minds, we are apt to forget that others may still need and desire information respecting them.—BERLEPSCH.

In thirty-six school districts, in the diocese of Brünn, in Moravia, there were in 1859, five thousand six hundred and fifty beekeepers, with an aggregate of 22,591 colonies of bees.

[For the Bee Journal.]

Bees:**WATER ESSENTIAL TO THEIR PROSPERITY.**

The fact that bees require great quantities of water in the spring and fore part of summer, or during the production of larvae, seems to be quite overlooked by most apiarians. That such is the fact, any one, by taking a little pains in the spring season, can readily ascertain; and there exists no doubt in my mind, that a proximity to water has much to do with the prosperity of bees. What the effect would be to have no water within the ordinary range of their flight, is not known, but probably it would seriously affect their prosperity, if they were obliged to fly a long distance to procure it. From observation I find that bees prefer to suck up water from low mossy places, or from the mud on the shores of streams. The reason probably is, that in such localities the water is warmer; and then again it is easier of access, as they evidently do not like to descend the perpendicular sides of any object to obtain that element, from fear of falling in.

Anything that prevents or retards the proper development of larvae, acts as a check upon their prosperity, therefore the apiarian should endeavor to facilitate those operations that come within the range of his ability. When swarms, by location, are cut off from a near supply by natural causes, it should be furnished them in some way. A shallow trough or pan is as good as anything, if fixed in such a manner that bees will not be apt to fall in, as they will be likely to if precautions are not taken against it, especially in the early spring when high winds prevail. A good plan is to place small stones in the vessel containing the water, or a perforated wooden float.

There is one fact connected with the honey bee, that I have never seen noticed by writers upon bee culture; and that is, when following their natural instincts in selecting a home in the forest, they invariably select a tree within a few rods of water in some shape—a stream, pond, swale, or low ground where water stands in the spring. I have found and have had knowledge of the situation of some forty-five wild swarms, and only one out of the whole number but what had selected a home where water could be obtained, at least in the spring, within six rods of the tree. Having often noticed that to be the case, I took considerable pains to get information in regard to it, by inquiring of those finding wild bees, and often going to see for myself, and always with the same result, with the exception of the one solitary case above mentioned, and that was but a meagre

swarm, evidently under a bad government, there being but few bees and very little honey. It may be argued that trees are more apt to grow gnarled and hollow in wet situations, and the bees find such by mere chance. It would be very singular, indeed, if that were the case, for many of the above swarms were found in hard wood growth, where hundreds of hollow trees, equally as suitable as those chosen, might have been found, but remote from water; and it is curious that such should *always* be passed by, and chance lead them near water. I believe that bees *generally* have a home selected before departing from the parent hive; and that situations in close proximity to water are *purposely* chosen; which is conclusive evidence in my mind, that bees in a domesticated state should be furnished, in some way, with a full supply of fresh water, during the season of rearing brood, if the natural facilities for that purpose are not adequate to their wants.

Andover, Me.

FRYER, JR.

[For the "Bee Journal."]

About the middle of February, of this year, in examining a hive of Italian queens, I found in two or three of the central combs, a quantity of sealed drone-brood in *worker* cells. The groups were about the size of a silver dollar each, and I think were on both sides of these frames. I also found one mature drone among the other bees, about the size of a large worker, which I suppose issued from a worker-cell. It was the smallest drone I ever saw.

The queen was a young one, placed in the hive about September last, and consequently not more than six months old. Unless there has been a casualty during the winter, she was the mother of most of the bees in the hive.

On the 2d of March, I caught an Italian drone just as he was entering another hive of Italian bees. He was about the usual size, rather smaller if anything. The guards at the entrance of the hive, seemed a good deal surprised to see him. They caught him and treated him pretty roughly at first, but they finally let him go, and he entered the hive rejoicing, no doubt.

I saw my Italian bees bringing in pollen this year, on the 2d day of March.

Hulmeville, Pa.

C. W. TAYLOR.

It has been observed that *drone* brood will be killed by a degree of cold, which does not injuriously affect *worker* brood.

Please send us the names of beekeepers.

The Italian Bee.

BY THE REV. GEORGE KLEINE.

(Fourth Article.)

I endeavored, in the two preceding articles, to enumerate the traits and qualities which, from observations made and results obtained during the past ten years, entitle the Italian variety of the Honey Bee to claim a preference over the common kind. The advantages which *scientific* bee culture has derived from the introduction of this bee, are universally conceded. Not a whisper of doubt in this regard, has ever been uttered in any quarter. But as regards an acknowledgment of its importance and significance, so far as *practical* bee culture is concerned, the case is different. Though it cannot be denied that, in this particular, superiority has been claimed for the Italian bees on many points in which they do not surpass the common kind, it is nevertheless demonstrated that they do possess peculiarities and properties which elevate them so far above the latter, that, if we would be just, we cannot deny their evident superiority.

The question, whether the Italian Bees are of *practical* value, has been largely discussed. It was expected that it would be decided at the German Apiarian Convention held at Düsseldorf in 1855, but was postponed till the meeting of the Convention at Güstrow in 1856, where, decision being still considered premature, it was again postponed till the meeting at Dresden in 1857, where it was once more made a subject for discussion.

The Baron of Berlepsch had expressed previously the opinion that, though the newly introduced variety of bees was *indirectly* of great practical importance, as a means of solving some of the most difficult scientific problems—thus elucidating theory, and *thereby* giving practical operations a more stable basis, it was in other respects of no direct practical value. But at Dresden he assumed higher ground and asserted that, apart from its peculiar markings, the Italian variety "is not worth a charge of gunpowder," though he acknowledged unhesitatingly, that it is more industrious and placable.

Dzierzon replied that, other conditions being the same, superior industry obviously implied greater productiveness; and that the conceded placable and gentle disposition of these bees, must necessarily exert a most decidedly favorable influence on the extension of bee culture. But the question whether this or that race or variety be preferable or more profitable, could not be decided

on theoretic grounds or by *a priori* reasoning. Close observation and long experience alone could determine the point. The results of experience, however, have already been clearly transmitted to us by the ancients; who, confessedly deficient as *theorists*, were unquestionably good *practical* apiarians, and most unequivocally preferred the Italian to the common bee.

Count Stosch, of Manze, in Silesia, after remarking that by careful selection and breeding, it was doubtless possible to produce a more beautiful, more constant, and, perhaps, more profitable race than the original Italian, proposed to subdivide the question respecting its practical value, and inquire, first, whether it is of practical use *at present*, and in the existing condition of bee culture? and, secondly, whether such utility is absolute and perdurable?

On the first point, he remarked that the demand for Italian bees is at present extensive and urgent. It is easier now to sell ten colonies of these, than one of the common kind. He who wishes to find a sure market, must cultivate Italian bees, even if it were true that, intrinsically, they are of no special practical value. He who would sell his wares, must adapt them to the prevalent taste and the fashion of the day. This is an arbitrary, absolute, and inflexible commercial axiom, as applicable to bees as to any other mercantile commodity. The fancy and whims of the purchasers, must be always taken into account.

As to the second point, he suggested that since the superior industry of the Italian bees was conceded without question or controversy, and the Baron of Berlepsch did still not admit that they produced more honey, the adverse opinion, as to results, must be grounded in some error or misconception. Comparative observations had, perhaps, not been made with sufficient care, or the products not accurately weighed; for, certainly greater assiduity in labor, persisted in through an entire season, must exhibit corresponding results at the close of the year.

It has been attempted to counterpoise the admitted superior industry of their bees, by their alleged greater disposition to build an undue proportion of drone-comb. But, according to his experience, the benefits derived from the former quality, greatly overbalances the supposed disadvantages resulting from the latter—especially when it is borne in mind that, in movable frame hives, the beekeeper can effectually restrict or control the production of drone-comb.

Again, if the fact noticed by the Baron of Berlepsch, that the greater number of his Italian queens died before completing their first year,

were corroborated by the uniform experience of others, then, indeed, the Italian bees would not be worth a stiver. He would concede, that the Italian queens do not attain to so great age as common queens, though, on the average, his own survived more than two years; and the alleged fact stated by the Baron, had wholly escaped the keen observation of Dzierzon. Yet, even a duration of life limited to so brief a period as two years, would be a grievous objection to the Italians, were it not the direct consequence of their superior fecundity. The greater alertness and industry of the workers produces a greater general activity within the hive, in turn exciting the queen to more frequent and regular egg-laying—thus reciprocally stimulating the gathering impulse in the workers, and the procreative impulse in the queen. An Italian queen lays fully as many eggs in two years, as a common queen does in three; and hence her vital energy is more severely taxed, and becomes exhausted at an earlier period. But, as a hen which would lay three eggs in two days, would be worth more than one which would require three days for the same purpose, even though the former should live only two years, and the latter should get to be six years old; so an Italian queen, though more short-lived, will be of greater practical value than one of the common kind, whose prolificness is notoriously small after her third year.

Finally, the mild and placable disposition of the Italian bees, is a most obvious advantage, commending them *feelingly* to our favorable consideration, and well calculated to render bee culture a more satisfactory and agreeable employment. Hence, after all that has been said, *pro* and *con*, it does not seem to be of much consequence to decide now, whether the Italian race is of high general or permanent importance; whilst this much, at least, appears to be certain, that it is decidedly valuable for practical purposes. And he could not, therefore, refrain from expressing the hope, that the culture of these bees may be prosecuted with the same zeal, and the same assiduity as hitherto, and be crowned with eminent success.

The general expression of concurrence in the sentiments of Count Stosch, elicited from the Dresden Convention, warrants the inference that the superiority of the Italian bees was fully recognized and endorsed by that assembly—as was likewise more clearly shown subsequently, by the more extensive introduction of this variety in the apiaries of Germany.

The general diffusion of the Italian bee, is certainly attended by numerous difficulties. It was soon found to be impracticable to send entire colonies in large hives to distant points, as, apart

from the expense, it in most instances involved the total destruction of the stocks, from careless and awkward handling. Dzierzon devised a more efficient mode, by placing a queen with a few hundred workers in a small box containing sufficient stores, and transmitting them by express, to those who desired to be supplied. The queen and her attendants were then introduced in a colony of common bees, previously deprived of their queen. By these means the new race was speedily established in all the more important sections of the country, and thence distributed in every direction. Dzierzon originally fixed his charge for a queen thus prepared for transmission, at ten dollars—a very moderate price, indeed, when the risks and labor involved in rearing queens, are taken into consideration. Yet some narrow-minded persons affected to regard it as exorbitant, and thence took occasion to traduce him, instead of applauding his readiness to aid others in procuring that which most of them turned to a source of pecuniary gain.

The introduction of an Italian queen among common stock, proved to be far from being so easy and uniformly successful as had been anticipated. I will not weary my readers with a rehearsal of the lamentations which arose in every quarter, over the mishaps which attended even the best planned processes, and disappointed the calculations of sanguine beekeepers. Still, it must not be supposed that the introduction is surrounded with insuperable difficulties. Hitherto, I have not myself been unsuccessful in a single instance, if, after depriving the common bees of their queen, allowing them to build royal cells, and destroying these when they were capped, I placed the Italian queen in a cage, closed the orifice with a thin scale of wax, and suspended it among the bees, between the combs. The bees invariably liberated the queen, and accepted her with evident gratification.


But if we would be altogether sure of success, the queen and her companions should be transferred from the transport box into a hive that is furnished with combs containing a liberal supply of honey. Then insert a small piece of comb with capped brood nearly mature. The bees will immediately take charge of this; and as the young bees emerge and strengthen the colony, additional brood comb should be inserted, and the process repeated till the requisite amount of population has been obtained. When this point has been reached, the apiarian has it in his power to multiply stock to any extent that may be desirable, or the state of his apiary may permit. His chief object must be to secure the production of an early and ample supply of Italian drones. This can be

best effected by means of a populous and well stored colony; and if that which contains the Italian queen, do not possess these qualities early in the ensuing spring, it should be fostered and aided by the introduction of capped brood-combs, and combs with honey and pollen—all of which may be taken from common stocks.

As soon as the Italian drone-brood is capped, the process of rearing queens may be commenced. The earlier this can be done after the drone-brood has reached this stage of development, the more confidently may we depend on maintaining the purity of the race, because the queens reared will be fecundated before common drones make their appearance. The suppression of the latter should be constantly aimed at, and can always be effected, to a large extent, where movable comb-hives are used. It is advisable to make a large number of *nuclei*, even though they be small and weak, because these give us a choice of queens, and enable us to select the brightest and best specimens for introduction among common stock designed to be Italianized, or for the supply of any artificial colonies we may desire to form.

Genuine Italian queens may still be reared in the latter part of summer, by purposely keeping some colonies in a queenless condition, so that their drones may be preserved, when those of other colonies are destroyed. But pure stock may be obtained, even while common drones abound, if the young queen and the Italian drones be incited to fly simultaneously at times when the former do not issue. By feeding the Italian stocks with honey warmed and somewhat diluted, two or three hours before the common drones usually fly, or after they retire for the day, our object may in most cases be attained.

If we have ordinary success in rearing young queens, and the weather be sufficiently favorable to allow them to make their excursions, and they are fecundated by Italian drones, it will be an easy matter to Italianize the largest apiary in a single season. This should be the aim and endeavor of every apiarian who, in addition to a source of pecuniary profit, wishes to provide for himself an unfailing fountain of innocent enjoyment. We should ever remember, that if bee culture is to be successful in the hands of any one, it must be prosecuted with zeal and devotion. He must learn to love and admire his bees, and to find in them and their management, ever-renewed and diversified topics of interest; nor can he derive greater gratification from any branch of his darling pursuit, than from the propagation and cultivation of the Italian race.

 Please send us the names of beekeepers.

[For the "Bee Journal."]

EARLY SPRING MANAGEMENT.

I pursue the following plan with my bees in the spring: As soon as the weather is sufficiently warm, I commence feeding them regularly with syrup made of refined sugar, in such quantities that they will store a little, and also give them access to as much rye meal as they will take, which I place in the open air in shallow boxes, sheltered from the wind. I prefer feeding the syrup in feeders, set in the upper part of the hive to prevent robbing, and close the entrance to about one inch—Feeding to be continued until fruit trees are in bloom, when it should be gradually discontinued. By pursuing this method, they will be stimulated to breed rapidly, and will be strong in numbers by the time they can find plenty of foraging. They will cast swarms from two to three weeks earlier, and when the honey harvest commences, they will be in a condition to reap the greatest benefit from it. Feeding, injudiciously conducted, is productive of more harm than benefit.

W. W. CARY.


[For the "Bee Journal."]


I was truly glad to hear that such a paper as the "American Bee Journal" is published in the United States, and no doubt it will be a welcome visitor to numbers of beekeepers—especially when there is so much humbugging in the shape of patent bee-hives, as there is in these our days.

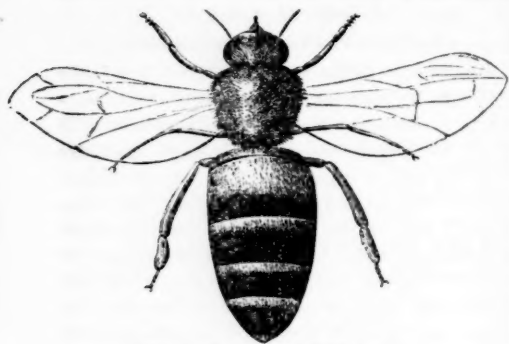
I wish to make an inquiry to which I should be pleased to receive a reply through the Journal. As the Italian queens are said to be more prolific than common queens, should not the hives wherein they are put, be larger, in order to give the queens more room to deposit all their eggs; so that we could reap the largest possible profit from them?

New Hope, Va.

J. F. F.

 It is stated that Dr. Hicks, of London, has recently discovered that the prismatic corneal lens in the eye of the bee, is a *compound double convex lens*, precisely similar in principle and construction to one of the latest improvements in the microscope, for the correction of the aberration of light. It thus appears that this recent triumph of inventive genius was devised and employed by the Creator, long before man was brought into existence; for, according to Hugh Miller, (*Testimony of the Rocks*), "the first bee makes its appearance in the amber of the Eocene"—the period which Geologists regard as the very dawn of the existing state of things.

 Please send us the names of beekeepers.



The Italian Worker.

(MAGNIFIED.)

The above cut of the Italian Worker, shows some of its peculiarities. A portion of the two upper rings of the abdomen, is a beautiful orange-color, as represented by the unshaded part of the drawing. The rings of the abdomen are also more deeply fringed with hair, than the common variety, that is, the black bee. When seen in sunlight flying against a window, it is impossible not to be forcibly struck with their beauty, they being then almost transparent. The abdomen is longer and more pointed. This peculiarity of shape is often present in half and quarter-bred bees, even when one or both orange-colored rings are absent. When gorged with honey, their peculiar form is still more marked. The following statement from Dr. J. P. Kirtland will be of interest to the public, from his high reputation.

"1st. Their disposition to labor far excels that of the common kind. From the earliest dawn of day to the arrival of evening, they are invariably passing in and out of the hive, and rarely suspend their work for winds, heat, or moderate showers, at times when not a solitary individual of the common kind is to be seen. Two hours each day their labors are extended beyond the working time of the last-named kind.

2d. Power of endurance, and especially of resisting the impression of cold, they possess in a marked degree. Since the Buckwheat, Solidagoes, and Asters have flowered, the nights have been remarkably cold in this vicinity. This low temperature has, in a great measure, suspended the efforts of the common Bees, and they have been eating their previously accumulated stores. Not so with the Italians; they have been steadily accumulating Honey and Bee-bread, and rapidly multiplying their numbers. They seem to be peculiarly adapted to resist the chilly atmosphere and high winds, which predominate in Autumn, on the shores of Lake Erie.

3d. Prolificness they equally excel in. Both my full and half-blooded stocks have become numerous and strong in numbers as well as in stores, at this late season of the year, when the common kinds have ceased increasing and have become nearly passive.

4th. Their individual strength is greater, and this is well illustrated in their prompt manner of tossing to a great distance, any robber that may chance to approach their hive.

5th. Their beauty of coloring and graceful forms, render them an object of interest to every person of taste. My colonies are daily watched and admired by many visitors.

6th. Of their moral character, I cannot speak favorably. If robbing of weaker colonies is going on, these yellow jackets are sure to be on hand.

So far as my experience has gone with them, I find every statement in regard to their superiority sustained. They will, no doubt, prove a valuable acquisition to localities of high altitude, and will be peculiarly adapted to the climate of Washington Territory, Oregon, and the mountainous regions of California."

We have seen testimony from Rev. L. L. Langstroth, Mr. Wagner of York, Pa., E. A. Brackett, the sculptor, M. M. Baldridge, apiarian, of Middleport, N. Y., and from other equally reliable sources, which corroborates the above statement from Dr. Kirtland.

The Italian Bee is less inclined to sting than the common variety. It has been widely circulated by advertisement, that "THEY WILL NOT STING." This statement is altogether untrue, and we can not imagine how any one can be so weak as thus to expose himself, when detection and exposure cannot be escaped.

New York.

E. P.

He who would become a thorough beemaster and successful beekeeper, must, first of all, study the theory of bee culture, based on a knowledge of the nature and habits of the bee. It is only thus that he can familiarize himself with the principles which are to guide and govern his practical operations. The whole subject will be clearly expanded before his view; and he will, in any case and under any circumstances, be able to decide what is proper to be done, and when to do it. Whereas, the mere empiric can never become a successful operator, though furnished with the most minute instructions; because it is impossible to foresee all the contingencies that may arise, or the peculiar phases which may present themselves in any special case. Difficulties will have to be encountered at almost every step; and he will perpetually be liable to make mistakes—discovering his blunders only when it is too late to apply a remedy. Hence, one who is himself a master, has emphatically said—"STUDY THE THEORY, if you would not remain a bungler all your life! PRACTICE is nothing else than APPLIED THEORY."

The Favignane apiarians call artificial colonies *babies*.

Notes on Humble Bees.

BY DR. DÜNHOF.

In all treatises on Entomology we are taught that there are two descriptions of workers among humble bees, and also two sizes of males or drones. This seemed to me so remarkable that I was induced to employ some school-boys to procure for me a number of humble bees' nests last summer. Nine of these I placed in small Dzierzon hives, that I might conveniently observe their habits and operations.

I found that there are not two kinds of workers differing from each other in size, nor two different kind of males; but that there is no uniformity of size whatever among either. They are all alike in kind, though varying in size from that of a common hive-bee to nearly that of a queen—the differences in size being almost infinite. I ascertained that this was the case alike with the *Bombus lapidarius*, the *Bombus terrestris*, and the *Bombus muscorum*. From one and the same brood mass workers of all the various sizes emerge. As the larvæ are crowded together promiscuously in the mass of pollen paste, the different degrees of development in size to which they severally attain, depends on the amount of space which falls to the lot of each. One is, of course, under such circumstances, more compressed and circumscribed than another, and its growth is correspondingly impeded or checked—just as in the case of hive bees, the workers are produced in narrow cells.

Prof. Leuckart and Dr. Küchenmeister conjecture that the sting of the queen bee discharges some important function in oviposition. On the 6th of July last I saw a humble bee laying eggs.

I observed her nibbling with her mandibles at the edges of an opening in a brood mass which contained some eggs. She then inserted her abdomen in the opening. In a few seconds she extruded her sting which remained motionless three or four seconds, when she retracted it, withdrew her abdomen, and closed the opening in the brood mass by drawing together the edges of the pollen paste, with her mandibles.

On the 2d of June, I removed the queen from a nest of humble bees. The bees showed no symptoms of being conscious of their queenless state.

On the 7th, I found that a new royal cell had been started. I opened it, and finding it contained eggs, I closed it again with pollen paste. A few weeks later young bees emerged from the cocoons in the pollen paste. They were exclusively workers. The bees continued brooding all


the summer, but produced males only. The males seem to be distinguished externally from the workers only by the shape of their antennæ, which are curved and resemble drone-antennæ in general.

Oken says, "as the humble bees seldom carry in pollen, though they use it in preparing paste for their brood, they must eat it while abroad and again disgorge it in their nests." This is altogether a mistake. In the summer season, when they have most brood, the humble bees may often be seen carrying in pellets of pollen; and on such occasions, if I waited till a bee had reached the nest, I always found, on examination, that she stripped off the pellets and attached them to the brood mass with her mandibles. The paste of which the brood mass as well as the honey-pots are formed, is simply this pollen paste, made of the pellets which they collect on their thighs. It soon becomes brown and glossy, just as pollen does superficially in the cells of the honey bee. This results from the exudation of an oily substance which the pollen contains. Probably this oily matter liquifies in process of time, by absorbing oxygen from the air, as may be inferred from the fact that fluid oils are more highly oxygenated than fixed oils; and that the change of color is only superficial. If pollen be placed on a sheet of paper, a grease spot will in a few days be found under it, and if a piece of brood mass or a honey-pot from a humble bee's nest be placed on paper and laid on a warm stove, a large grease spot will immediately be produced. Oken thinks that the paste of the honey-pots differs from that of the brood-mass, and calls the paste of the former *demi-wax*, and that of the later *wax*. In this he is certainly wrong.

The bee moth very frequently deposits her eggs in the nests of the humble bees; and the emerged larvæ subsist exclusively on the pollen paste. I found over twenty bee moth larvæ in the pollen paste with which the workers had over-arched their nest below the covering of moss under which it was situated. These were orange-colored. The color was doubtless derived from the pollen paste which they had devoured—the coloring matter being liberated during digestion, and secreted in the skin.

I daily examined my humble bees' nests, looking for dead humble bees. I found some on ten occasions, and on dissecting them invariably discovered a large larvæ, completely filling the abdomen. It was apodal, and when warmed moved like the larva of the bee moth. In two instances I succeeded in severing the abdomen without injuring the larvæ. In a few days these were transformed into chestnut-brown pupæ, which have not yet emerged. They appear to be the pupæ of some species of fly. The parent insect must deposit the egg by inserting its ovipositor between the rings of the abdomen, and the humble bee perishes about the time when the larvæ attains full growth, and is ready to enter its pupæ state.

WEIGHT OF A SWARM OF BEES.

 We occasionally find such crude articles as the following in the newspapers:

"**WEIGHT OF A SWARM.**—It is estimated that a full swarm of bees weighs eleven to twelve pounds. Hence, all excess over that is honey and comb, so that the quantity can be ascertained by weighing the hive, if the weight of that is known, as it always should be, and marked upon it when new."

We suspect that he who suggested this, never made a practical application of it, or the result would have convinced him, that his rule is rather the exception than the norm. In the first place, he appears not to have adverted to the fact, that the weight of some hives will be considerably increased by the absorption of moisture after a swarm is introduced, and will also be somewhat affected by the quantity of propolis used. In the second place, he makes no reference to the pollen which the bees store away in the cells. And in the third place, the weight of the brood is altogether left out of the account—though a strong, healthy colony is rarely without any, and at times it constitutes a highly important item. At a period when the queen's power of ovipositing is by no means inordinately tasked, she lays 2000 eggs per day; and there will then be at one and the same time 10,000 larvæ and 32,000 pupæ or nymphs in the brood-cells. A larva just hatched, weighs the three-hundredth part of a grain, and three grains when full grown. The average being $1\frac{1}{2}$ grains, the larvæ weigh 15,000 grains. The average weight of the pupæ or nymphs is $2\frac{1}{2}$ grains, and the 32,000 in the capped cells weigh 72,000 grains. The aggregate weight of the brood will hence be 87,000 grains, or $11\frac{1}{2}$ lbs. avoirdupois. To this, add 3 lbs. for pollen, and 1 lb. for increased weight of the hive from imbibed moisture, with an allowance for propolis, and we have a total of $15\frac{1}{2}$ lbs. which, under the above process, would have to be set down as "honey and comb," to the no small disappointment of the sanguine beekeeper, who should undertake to realize. The amount of brood in a hive, it is true, is a variable quantity, fluctuating probably from half a pound to eighteen pounds, according to season and circumstances. But the above rule is absolute, having no reference to contingencies; and we wish simply to hint that there are, at times, "more things" between the bottom board and the apex, top, or honey-board of a hive, than are "dreamt of" in the "philosophy" of some folks.

What is the impulse that causes workers to construct royal cells in a hive which has a vigorous fertile queen?

[For the "Bee Journal."]

I thought of engaging in bee culture, but having had an unfortunate beginning, I feel discouraged. Perhaps it was my ignorance of the proper management that was the cause.

I procured a swarm in June last, which I put into a Langstroth hive. By fall the hive was filled below, and had fifteen pounds of honey in the comb in the upper story, which I took and used in the family. The bees are doing well, and this encouraged me.

I then procured colonies where the owners intended to kill them, and with comb put them into hives, and fed them. They appeared to do well till about the first of January, when all perished. I thus lost four colonies from some cause unknown to me, as they had honey in their hives. Perhaps they were frozen, or needed something more than honey to keep them alive.

I intend, however, to try again.

Urbana, Ohio. •

J. F.

[For the "Bee Journal."]

I put into a *bee-clamp*, twenty-four stands of bees on the 24th of November last. The temperature within, this morning, (Feb. 25th,) was $38\frac{1}{2}^{\circ}$, outside 22° . Three of the four vent holes I stopped. Yesterday with the four vent holes open, the temperature inside was 34° , outside 24° . Lowest temperature inside this winter 34° , highest 44° ; generally from 37° to 39° .

I shall take them out in about three weeks, and let you know how they come out. This has been an extremely bad winter for bees. I have lost one-fourth of my stocks that I wintered out.

Milford Center, Pa.

R. P. M.

[For the "Bee Journal."]

In 1859, I divided a swarm of bees, placing the queen with three frames of brood and bees in a new location. A few evenings after, the bees became very much excited, pouring out of the hive and making the peculiar noise indicating the loss of the queen. I at once placed in the hive a comb containing a queen-cell sealed, and the bees immediately became quiet. Next morning, a dead queen was found at the mouth of the hive; the queen-cell vacant, and open on one side. The swarm did well, having a prolific queen. I have had two similar cases since. Can any of your correspondents explain the cause of the commotion in these hives?

Providence, R. I.

J. C.

Does the queen bee ever deposit an egg in a royal cell?

[For the Bee Journal.]

Breeding in-and-in.

The system of "breeding in-and-in" is generally conceded, I think, to be highly deleterious to a species—human, animal, fowl, or insect; and it is found that vegetables "run out." But who has thought to practically apply the principle to bees, or supposed that it would apply to that profitable insect, causing it in the least to deteriorate?

Much care is now taken in the breeding of neat stock, and horses, sheep, swine and poultry. But who does the same with bees? Or who supposes that the laws of nature are not as inexorable with bees, as with cattle, horses, swine, or poultry? Yet they are just as true in the one case as in the other. May not much of the deteriorated and diseased condition of bees, be attributed to long continued breeding in-and-in? I am not prepared to answer positively; but from near thirty year's experience, I am strongly inclined to think that this may be so. I find in all sections in which I travel, that bees "run out." On inquiry, I generally learn that a "long time ago," they did well, but "somehow of late years they haven't done as well, or done much; don't know what the cause is." On asking how long they kept the same stock of bees, some say twenty years, some twenty-five, some thirty; some had them from their fathers or grandfathers. Inquire whether any pains were ever taken to improve the stock, and the reply is, "No!"

In cases where neighbors have kept bees near by each other, I generally find better stock, or where bees have been procured from such neighborhoods. Also, wild bees, when procured, I notice are more vigorous than tame ones. I am informed by a successful apiarian, that he has known wild swarms placed in an apiary of from ten to fifteen swarms, and in three or four years they had possession, the others having dwindled out.

A few days since, I fell in company with one of two brothers, living but a few rods apart, whose bees I had noticed to be better stock than the average. I inquired how long they had had them. He replied, about forty years. Have they always done well? Yes. I spoke of the benefit of crossing. "Well, said he, there may be something in that. The first swarm I had, I found; and since, I have frequently found wild swarms and placed them in my apiary."

Within a recent period, I had an opportunity to examine some twenty-five or thirty stocks diseased with "dead-brood." Such of these as I can trace, I trace to apiaries that have been conducted for years on the breeding in-and-in system. Some

time last summer, I had the curiosity to examine combs containing dead-brood. Where not too far putrified to show its position, I found it rear end outwards towards the cap. I have since examined several, with the same result.

I wish to hear from others, on this and other points; and to have apiarians who have opportunity to examine with reference to putrid dead-brood, its position, and the position of the eggs in hives that have dead-brood; the appearance of the queen, and whether she is young or old; and whether from swarms or apiaries that are old, and have been bred in-and-in. I would likewise suggest putting in, for experiment, queens that have not had dead-brood, instead of those that have, after pruning out such comb as has dead-brood. I have practised this pruning, but the same difficulty kept occurring, with no improvement than to keep the swarm along a little longer. From my recent observations, I am inclined to think inability on the part of the queen to place her eggs properly, or on the part of the larva to assume its proper position, is the cause of the disease.

New Britain, Conn.

C.

[For the "Bee Journal."]

How can a person unite two swarms in the fall, without danger of being stung, and without the bees fighting? It is said that two swarms so united, will winter on about the same amount of honey that one of them would have needed. I should like to have this inquiry answered through the Bee Journal.

Warren, N. H.

W. F. E.

[For the "Bee Journal."]

I have in use the Langstroth hive, and use his movable comb frames. I wish to inquire what number of frames should occupy a given space, and the distance from each other to the centre of the outside frames. I have "*Langstroth on the Hive and Honey Bee*," second edition, and on page 432, I find the width of one hive that he recommends to be twelve inches, with eight frames; and on page 483, he recommends 14½ inches for the side width, with ten frames. You will thus perceive, that the two do not place the frames the same distance apart. I am inclined to think, that there is an exact distance that the frames should be set, from the centre of one to the centre of another. Hence this inquiry. I am making my own hives, and would like to avail myself of the experience of others who have had more and longer practice than I have.

What is the best implement to use to blow smoke in the hive, before opening and handling the bees or frames?

Enfield, Conn.

G. T.

Cost of producing Wax.

How many pounds of honey are required to enable bees to produce a pound of wax? This is an interesting and important question. It has been frequently investigated, and the conclusions arrived at differ greatly.

Gundelach made some minute and careful experiments, the details of which are given in his "*Natural History of the Honey Bee*," and the results showed that about twenty pounds of honey were used by the bees, in producing a pound of wax. But, in his experiments, the bees were confined to the hive; the queen, also, was placed in duress, apart from the workers; and the latter were not supplied with pollen—which was not supposed to be needed for the production of wax. Thus the little colony was clearly in an abnormal condition, and the result showed only how much honey, bees, under *such* circumstances, require to produce a pound of wax.

A similar experiment, with like results, was made by the Baron of Berlepsch. In a subsequent experiment, he allowed the bees free access to pollen, and ascertained that, in such case, thirteen pounds of honey (exclusive of the pollen consumed,) sufficed to produce a pound of wax. But as here also the bees were kept confined, the result does not show how much honey is used by the bees for this purpose, in their free and unrestricted operations, at the season when comb is usually built—that is, when pasturage abounds, and the weather is favorable to their labors, in doors and out.

Again, Count Stosch, taking the second experiment of the Baron of Berlepsch, as the basis of his estimate, thinks due allowance should be made for the time spent in comb-building by the bees, and which, if devoted to honey-gathering, would have enabled them to store up at least twenty pounds. Hence he concludes that, with the actual consumption and the necessary allowance for time and labor, the cost of a pound of wax is fully equivalent to thirty pounds of honey. This, in money value, at eighteen cents per pound, is equal to four dollars and fifty cents; whilst the wax itself, properly prepared for market, would not sell for more than forty cents—thus involving substantially a loss of four dollars and ten cents. From all this he infers, that the beekeeper cannot afford to melt down good and clean empty combs; and that the most profitable mode of disposing of them, whilst they remain in a condition acceptable to the bees, is to re-insert them in the hive on the removal of filled combs—thus saving the time, labor, and honey required for the construction of new combs. He further remarks, that his

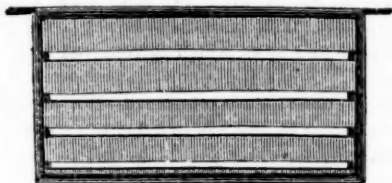
estimate is based on the operations of bees in *ordinary* periods. Whereas, if comb be built when pasturage is very abundant, time and labor being then more precious, the cost of a pound of wax is of course much greater, or fully equivalent to fifty pounds of honey. Hence he regards it as very important, or rather highly essential, that the beekeeper should be so situated as to be able to supply his bees with empty combs *ad libitum* while pasturage abounds; and induce them to build combs, if any be needed, only at times when the nectar of flowers is less plentifully yielded. It is at such times only, that wax can be produced by bees at the minimum cost. Bees will build freely and rapidly only when pasturage is abundant; but their labor might then also be more profitably employed. Besides, the weather may suddenly change and cut off their supplies, and they may find themselves in the position of having spent honey and time in the construction of combs, which they are subsequently unable to fill. But if their energies had the while been wholly devoted to gathering honey, and their stores garnered in combs supplied by their owner, their store-house would have presented a different and far more gratifying spectacle. If, afterwards, pasturage should continue to be only moderately abundant, a portion of the full combs may be removed, to give the bees an opportunity to build new ones. This would check their disposition to swarm, and prevent them from idling away their time, from want of storage room. If, in the end, from unfavorable weather, they fail to build comb, or are unable to garner additional supplies, their preservation during the winter may easily be secured, by restoring to them some of the full combs previously removed.

This is, no doubt, a judicious process, deserving of imitation; but still the Count's estimate of the cost of producing a pound of wax, is evidently somewhat exaggerated; for he does not take into consideration that the nectar of flowers, as gathered by the bees, is not precisely in the condition of what is known as honey. It contains so great a proportion of mere water, that it must lose one fourth of its weight by evaporation, before it attains the proper consistency to be called honey. Again, comb-building is to a great extent carried on at night, when bees do not leave their hives to forage, however abundant the pasturage may be. During the height of the gathering season, moreover, honey is more quickly converted into wax, than at other periods; and consequently the alleged loss of time is, doubtless, less than he assumes. Nevertheless, making due allowance, the cost of producing a pound of wax is manifestly greater than the Baron of Berlepsch rates it; and probably fully as high, if not higher, than the original estimate made by Gundelach.

Artificial Comb Guide.

An Illinois correspondent inquires whether there is "anything later than what is contained in the second edition of '*Langstroth on the Hive and Honey Bee*,' in regard to keeping the comb from deviating from the frame," and suggests a plan which he thinks might answer the purpose.

We doubt whether what he proposes would prove successful, as we have known an expedient nearly similar, fail on trial. The only efficient comb guide yet introduced, that has come under our observation, is one invented by Mr. Richard Colvin, of Baltimore, constructed as shown in the following cut.



This has been in use several seasons, and has, we believe, invariably caused straight combs to be built, in the hives in which it was employed. We have seen a number of large sized combs, built under constraint of these guides, which, for straightness and uniform thickness, precisely adapted to worker-brood, much surpassed those constructed by bees left to the operation of their own whims.

The guides consist of partitions as represented above, of the same length and depth as the comb frames. They may be made of tin, wood, or other material. Though tin is somewhat expensive, (25 cts. each, or \$2.00 per set,) yet it is preferable, as it takes up less room than wood. The guides are made of slats; and if of tin, with a bead around the edge, to keep it straight and out of wind. The slats are placed about three-eighths of an inch apart, and are about $1\frac{1}{8}$ inch in width. The top one, including bead, two inches.

In using these guides, if of tin, one frame only need be removed out of the hive, to give the requisite room. If of wood, three-sixteenths of an inch thick, two frames must be taken out, leaving only eight in the hive. Then set the two outside frames in their proper places, and the other eight or nine, (as the case may be,) equidistant from each other, so as to fill out the intermediate space; and next, hang one of these guides exactly in the centre between each two frames. The sides of the hive should be set perfectly level with each other; and care should be taken to see that both guides and frames hang plumb, before the swarm is put in,

as well as afterwards. When it is placed on a level stand, raise the back end of the hive about two inches. Let the guides remain in, till the bees have filled all the frames with comb; then remove them, shove the frames to their proper places, and put in the frame or frames which had previously been removed—placing them near the centre of the hive, and each between two combs containing brood. When in that condition, the bees will not elongate the cells, and *must*, consequently, build straight comb in these empty frames also; and they generally do it, at the height of the honey season, in about two days.

Beekeepers using the Langstroth hive, and living in territory belonging to Mr. Colvin, or Mr. Langstroth, have the privilege of using these guides free of charge.

[For the "Bee Journal."]

WINTERING BEES.—ITALIAN BEES.

I put out all my bees on Wednesday, February 27th. Four days of warm weather succeeded. On the last two, they obtained pollen from the "Candle Alder."

I have not been so well pleased with any plan for wintering bees heretofore, as with the success I have had in storing them in a dark room, the past winter. My neighbors, who wintered theirs in the usual way, lost a large number of their late swarms of last season, and find the surviving ones much weakened. A friend, who wintered eleven or twelve stocks on their stands, in the Langstroth double glass-cased and frame hives, had his bees suffer severely from freezing and dampness. He left the honey-boards on, but opened half the holes for the escape of moisture. It would probably have been better, if he had removed the boards; but then they might have suffered from freezing.

I have been quite surprised in my experience with Italian bees, at their success compared with the common. I could not credit the report of their great superiority, as in everything they seemed so like our common bees, except in the coloring. I am now quite ready to believe, that their introduction into this country will not only greatly increase the interest in bee culture, but that they will be the means of greatly enhancing the profit of the apiary, with the same management.

Chester Co. Pa.

L. P.

THE CLEVELAND CONVENTION.

We intend giving a full report in our next issue, of the proceedings of the Beekeepers' Convention, recently held at Cleveland, Ohio,

Bees in Common Hives.

KRITZ'S METHOD.

Early in spring, select four stocks in common hives. They should be such as have wintered well, are of medium size, and are well supplied with honey and pollen. If they are already populous, prune off only the lower margins of the combs, and remove all the droppings from the bottom boards, or give them clean and dry ones.

Feed these stocks moderately every other evening, to encourage brooding, so as to have them strong and in good condition by the first of May, or a week earlier, if the weather be settled and moderate. Then for the sake of convenience, mark the stocks respectively A, B, C, D, beginning with the heaviest and most populous. As soon as the bees of A cluster outside and several hundred remain out over night, drum out a strong swarm, remove the parent hive to some other location, and set the driven swarm in its stead. Six or seven days after, when a number of royal cells have been started in A, transpose A and B, performing the operation at about noon, or when the bees are flying most briskly. The consequence

will be, that A will at once receive a large accession of bees from B, and thus become as populous as it was before the swarm was drummed out.

As soon as the young queens rearing in A are mature, or in the course of from five to ten days after the transposition was made, a strong swarm will issue from it, fully equal in numbers and weight to an ordinary natural first swarm, and more valuable than a first swarm, as having a young queen. This swarm is to be set in B's place, while B is removed to the place now occupied by A, and the latter removed to where C has hitherto stood—C being transferred to a new location. A is thus again strengthened by bees received from C, and will send out another swarm on the second or third day after these changes were made. The swarm is to be set in the place now occupied by C, which is removed to a new location. A and D are now transposed. A will thus be once more reinforced—the accessions coming from D, and will in a day or two send out a third swarm, which should be set in any convenient place, because A, having rendered the service required of it, is not to be again removed.

The subjoined illustration may serve to render the process more intelligible.

Original arrangement of the hives:



After drumming out a swarm from A:



After the first transposition:



After A yields the first voluntary swarm:



After A yields the second voluntary swarm:



After A yields the third voluntary swarm:



Thus from one stock which furnished bees and queens, and those others which furnished bees only, we shall have obtained four seasonable swarms, all having come early enough to gather ample supplies for the winter, if pasturage be ordinarily abundant. True, B, C and D will not subsequently swarm. But it was not designed that they should, as we have already virtually taken one swarm from each.

The advantage of this method is, that it approximates more closely to natural swarming than any other mode of artificial multiplication, which can be adopted where common hives are used; since, of the four swarms obtained, only the first was produced by constraint. The other three are in fact voluntary natural swarms—the bees having simply been impelled to swarm sooner than they would otherwise have done; this effect being caused by the presence of early maturing queens, in the regularly reinforced colony.

What objections can be urged against this method, and what improvements can be suggested?

[For the "Bee Journal".]

I hail with pleasure the advent of the "*American Bee Journal*," which I have had the opportunity to peruse. It seems to be just the publication needed in this country; and while it maintains the position it has taken, it may rely on at least one working friend. Much of my time is spent among bees, taking care of, transferring, dividing, doubling up small swarms, driving, forcing, &c., for myself and others, both in and out of town, so that I have much practical experience, and opportunities to introduce the *Journal*, which I shall strive to do.

On page 4 of the January number, is an article about a dwarf queen, by Liebe. The eggs, properly placed by this queen, hatched; the others did not. What became of those not properly placed? Did they develop, and become dead-brood, or not grow at all? If there was dead-brood, which end was turned towards the cap?

In a similar case, which I had an opportunity to examine, an importer of Italian bees and seller of queens, received his ten dollars as per terms. The purchaser in due time received a *small* queen, "to say the least." On examining the comb that accompanied her, perhaps two weeks after her arrival, I found so-called dead-brood. Many of her eggs had hatched, but the larvæ did not come to maturity—dying in the cell, with the wrong end or rear end turned towards the cap. C.

☞ The wrongly placed eggs noticed by Mrs. Liebe, did not hatch at all.

BEE GOVERNMENT.

Undoubtedly the GREAT CREATOR and WISE LAW-GIVER has instituted a *government* for the bees; yet the *swarm* requires no *leader*, nor the *colony* a *sovereign*. The *administration* is not committed to any one individual. To each member of the *community*, whether worker, drone or queen, is assigned a specific duty, task or function; and the disposition and desire to labor in its vocation is implanted into each, so that in their several spheres all co-operate for the general good—the welfare of the *commonwealth*. The queen—the mother bee—is, indeed, of the first and highest importance to the colony, but she is not its sovereign, nor in any aspect its guide, leader or governor. Impelled by the instincts of her nature, she performs her duties in the family, like every other bee, in accordance with her faculties and to the extent of her ability. Nevertheless, she occupies, on the whole, a subordinate station. *The supreme power resides in the masses*. Decision and action emanate from them as a body. Their will determines; their wishes rule. Though ordinarily they tenderly nourish and cherish, protect and defend the queens, drones and brood; yet when the prosperity or preservation of the colony demands it, they imprison, mutilate, expel or destroy either. From their arbitrament there is no appeal; their decree is absolute and subject to no reversal; and their power cannot be resisted.—BALDENSTEIN.

SUPERSTITION.

In the "Illustrated London News," it is stated that the following curious superstition prevails in the county of Durham, (Eng.) When the head of a family dies, who keep bees, after returning from the funeral, one of the family gives the bees a taste of everything partaken of at the funeral—such as wine, cake, cheese, ale, and even tobacco; for it is believed that, without this mummery, the bees will die. The origin of this silly custom is not known.

Late London papers contain the following:

"Nearly all the bees in the south of England have died this year. A person in the New Forest, who had one hundred and forty hives, has lost every bee."

☞ The large number of communications which we have on hand, with other valuable matter, warrant us in saying, that the May number of the "Bee Journal" will be very interesting.

☞ Please send us the names of beekeepers.

[For the "American Bee Journal."]

Suggestions

FOR

IMPROVING THE BREED OF ITALIAN BEES.

In breeding Italian bees, two points are of special importance. First, to prevent degeneracy; and secondly, to improve the race still further by careful breeding.

If Italian queens, when impregnated by common drones, always produced workers partly Italian and partly common, it would be easy in breeding, to reject all such queens. But unfortunately all the progeny of such queens, are sometimes *apparently* full-blooded Italians. Proof of this is found in the article on Italian bees in the first number of this Journal. I have, in my own apiary, two such queens reared from the original queens imported by Mr. Parsons, of Flushing, (N. Y.,) and impregnated some time before any Italian drones were hatched. If I had not known that these queens were impregnated by common drones, I might have sold them for full-bloods, or used them in rearing other queens. And there is reason to believe that, in Germany, queens of this character have been used as pure.

Prof. J. P. Kirtland, of Cleveland, (Ohio,) in a letter to me, says—"I reared three queens which were impregnated by common drones, the worker progeny of which present the features of full-blooded Italians, only in a less perfect degree. Such queens, I fear, will be palmed upon the public by dishonest dealers, as full-bloods."

"Dzierzon gives it as the only reliable evidence of the genuineness of a queen, that her royal daughters, fecundated by an Italian drone, produce Italian workers exclusively; and all good apiarians, engaged in rearing Italian bees, concur in this view." (See page 19 of the *Bee Journal*.) Now as drones will fly a mile or more to meet a queen, we cannot be *sure* that our queens are impregnated by Italian drones, until we have raised queens from them, and are sure that these queens are rightly impregnated!

I have, for some time, thought that a way might be devised for attaining complete certainty as to the kind of drone by which Italian queens have been fertilized; and this without the tedious delay required on any plan now known. On page 127 of "*Langstroth on the Hive and Honey Bee*," and in the March number of this Journal, it is stated that the pursuit of the queen by the drones was witnessed, by fastening to the thigh of a young queen, a fine silken thread; and that the queen thus fastened was actually impregnated. In the same number of the *Bee Journal*, details are given of the impregnation of two queens so near the hive that, in each instance, *the impregnating drone*

was secured. It would seem then that, by means of a fine silken thread, we may succeed in having young queens impregnated so *near* the hive, that the drones may be secured. Let a stock containing Italian drones be established a few rods from any other stock, and to prevent young queens from leaving their hives to meet the drones, let the entrance be adjusted so that only a worker can pass through. An hour or more before the drones begin to make their daily flight, by feeding this isolated stock with strained honey or sugar-syrup, both workers and *drones* will be excited to full flight. Now bring a queen a few days old before this hive, having one of her thighs fastened to a thread, so that when she is allowed to fly, she may be kept in full sight. The drones will probably be more apt to notice her, if they are kept hovering on the wing, near the hive, by closing the entrance, or covering the hive with a sheet. If the plan succeeds, as the impregnating drone may be secured, it can easily be ascertained to what race he belongs, and thus *nothing be left to conjecture*.

The Germans are of opinion, that there is "*a dash of black blood*" in the Italian bees, even in those districts where it is found in the greatest purity; and as beekeeping in the Italian Alps is in its rudest state, there is no reason why this mixture of black blood may not have existed for thousands of years. The Baron of Berlepsch says—"The Italian race, as we now have it, is not constant in color. * * * Nay, I might even venture to assert that the Italian bee is not yet a perfectly distinct and peculiar race, but requires to be made such by a course of careful breeding, by which the dash of common blood shall be excluded." Those who are acquainted with the methods by which the Durhams, Devons, and other breeds of cattle have been formed, will readily see that if we can *control* the breeding of bees, so as to breed from the best males and females, we can easily improve the Italian race. Mr. E. A. Brackett, the distinguished Boston sculptor, informs me that in the fourth generation he obtained, last year, by careful breeding, an Italian queen of a perfectly golden color. Even in our Northern States, we may raise six or more generations of queens in one season; and thus in a few years, if improvement is possible, we may reach the results of a long life time in the breeding of cattle.

While the German apiarians have proposed to breed queens from none but the most perfect and beautiful mothers, they have as yet devised no plan by which we can *make sure* that these queens shall be impregnated by the most perfect drones. As the drones of some Italian queens are much

more beautiful than those of others, we can select a stock containing such to impregnate our queens.

Even if the method which I have described should fail in practice, (and only an ignorant or reckless beekeeper would claim success for any such plan, before it has been fully tested,) it may still be possible to make great improvements. A number of the most beautiful drones might be caught, as they are leaving or entering their hives, and confined in a small hive containing one of the choicest unimpregnated queens. Then if this hive is carried some two miles from the apiary to a secluded place, and the drones excited by feeding, to make an early flight, good results may be obtained. Other processes will suggest themselves to the skillful, when once their minds are "put upon the track." And there is this to encourage us, that we may succeed in greatly improving the breed of Italian bees, by confining our attention to a few stocks, and may then in a short time supplant all our inferior queens, by those raised from the choicest parents.

In the apiary of Mr. Parsons, notwithstanding all the precautions employed by experienced beekeepers, a large percentage of young queens were lost* when they flew to meet the drones. This loss and the great delay which often occurs in the impregnation of queens, might be obviated by the process above described. As the crosses of Italian bees with black bees are found to be much superior to black bees, even those beekeepers who use the common hives will find it to their advantage to purchase an Italian queen. The great majority of those who use the improved hives, will probably find it best to aim, the first season, at supplanting all their common queens by Italian queens—without any special reference to whether they are impregnated by Italian or by common drones. The next season, as they will have none but Italian drones, they can from one purely impregnated queen obtain all the pure queens they need.

L. L. L.

Oxford, Ohio.

* Prof. KIRTLAND says:—The King-birds killed several of my young queens last autumn. These brilliant Italians are a conspicuous mark for such depredators.

BEE MOTH TRAP.

Take a wooden bucket or other large open vessel, and fill it about two-thirds with water. Then put in a quantity of old honey-combs, and set the vessel in the apiary, at night, near the hives. The bee moths or millers will be attracted by the strong odor arising from the vessel, and after hovering over it awhile, will drop into the water and be unable to extricate themselves.

Apistical Botany.

A complete catalogue of indigenous honey-yielding plants, with their botanical and common names, characters, habitats, etcetera, is felt to be a desideratum by every reflecting beekeeper. Most treatises on bees contain lists of plants producing honey; but even the best of these are exceedingly meagre, and furnish no adequate means of estimating the adaptedness of any district or country for extended bee culture. An attempt was made, a few years since, by Dr. Alefeld, to furnish the apiarians of Germany with the desired information, in a scientific form, by preparing a treatise on what may be called *Apistical Botany*. Though in some respects incomplete, that treatise is a decided advance on previous efforts in that direction, and therefore deserves notice and commendation. It would, however, be useless to reprint it here, as the Flora of this country differs widely from that of Germany, on which it is based. Yet, a general statement of the results, which his investigation enabled Dr. Alefeld to reach, may be interesting;—especially as we understand that the preparation of a similar treatise, adapted to the United States, is contemplated by a gentleman well qualified for the task.

Cryptogamous plants furnish neither pollen nor honey, and are therefore of no account in bee culture. The apiarian is interested only in phænagamous plants, and their distribution in his vicinity. It thus becomes desirable for him to know, at least approximately,

1. What is the number of phænagamous plants composing the entire flora of the country?
2. What proportion of these furnish pasturage for bees?
3. How many of them yield honey only?
4. How many yield pollen only?
5. How many yield both pollen and honey?

The entire flora of Germany and Switzerland, says Dr. Alefeld, comprises about 3500 species of indigenous plants; and of these, according to recorded observations, about 500 or one-seventh of the whole number are visited by bees. This, is exclusive of alpine and maritime plants, which have not been examined in this respect.

Assuming $1\frac{1}{2}$ leagues as the largest radius of the bee's flight, Dr. Alefeld found that, within such area around his residence at Darmstadt, in the Duchy of Hesse, there grow 700 species of indigenous phænagamous plants—being precisely one-fifth of the whole ascertained number growing in Germany and Switzerland.

On a further analysis of his list, prepared from

his own observations and those of other botanists, be found that, of the local flora—

50 species, or one-fourteenth, yield pollen only.

100 species, or one-seventh, yield both pollen and honey.

150 species, or more than one-fifth, yield honey only.

Hence 300 species, or three-sevenths of the local flora, furnish pasturage for bees, or constitute the *bee flora* of his district; and 400 species, or four-sevenths of the whole, furnish no supplies.

Of the 300 species constituting the local *bee flora*, Dr. Alefeld personally examined only about 200. The remainder are included in his list on the authority of other observers, chiefly of Gleditsch, whose statements are not always reliable.

The above classification shows that, in his district, bees forage about 250 species of plants yielding honey, and 150 species yielding pollen. He conjectures that from about 25 species *propolis* also is collected; and that there may be, in his vicinity, about 20 species more yielding honey and pollen, though not yet actually ascertained, but which will eventually be added to the list. The result of his investigation would thus be, that precisely one-half of the phænagamous plants of his district, constitute its *bee flora*.

Then, as the number of species of indigenous plants found in Germany and Switzerland, is five-fold greater than that of those found growing within the area of the flight of Dr. Alefeld's bees at Darmstadt, he infers that his vicinity furnishes a fair average of the distribution of such species in the country generally. Hence, he concludes it is highly probable, that if the proportional numbers ascertained for his district be multiplied by five, it would determine, with reasonable accuracy, the extent of the *bee flora* of Germany and Switzerland. As the conjectural addendum of twenty species would most probably be comprehended in the list of species yielding "pollen and honey" and "honey only," the relative numbers of the species of the flora of the entire country, would probably range as follows:

250 species, or one-fourteenth, yield pollen only.

600 species, or more than one-sixth, yield pollen and honey.

900 species, or more than one-fourth, yield honey only.

1750 species, or one-half of the entire flora of these countries, constitute their *bee flora*; and the remaining 1750 species furnish no pasturage for bees, and are of no account in bee culture.

Dr. Alefeld's treatise is a valuable contribution, but defective in several respects. He does not specify, except in a few instances, whether the particular species of which he is speaking, yields honey abundantly or not. Nor does he state the relative proportions in which the wild or uncultivated plants occur in his district, or in the general flora of Germany and Switzerland. Yet these are important items, and unless we possess a tolerably accurate knowledge of them, we cannot form a proper estimate of the value of the *bee flora* of any district or country. Some plants may yield honey very abundantly, but be so rare that the amount gathered from them is small. Again, they may be abundant and yield honey profusely, but may all bloom simultaneously and be of transient service; whilst there are no others succeeding them, to keep up a supply of pasturage. Or they may bloom very early in the season, when the generality of stocks are yet too weak to avail themselves properly of the abundance around them.

In preparing a *bee flora*, these points require attention. The time of flowering is, indeed, invariably noted in botanical works; but we are rarely informed whether the species found in any given locality, are abundant there or not; or what proportion they bear to other species there prevalent, or to the general flora of the country, or to the *bee flora* more especially.

These are the more important deficiencies of Dr. Alefeld's work. We have not adverted to them from any carping disposition, but with a view of inducing those, who may be willing to aid in collecting materials for a similar treatise embracing the *bee flora* of this country, to give a wider scope to their observations.

We stated before, that the preparation of such a work is contemplated by a gentleman well qualified to do it justice, if properly aided by observers in various parts of the country. We hope he will receive such assistance, and would invoke the interest and active co-operation of every lover of bees within our territorial limits. As in the case of meteorology and other branches of physical science, each observer at his special station should note and record, during the whole of the ensuing season, the facts that fall under his eye. These facts might then be forwarded to the publishers of Bee Journal, in the form of a report, to be collated and compared with the others. In this way, using the material already at hand, a very valuable work may be produced. Of course, due mention and credit will be given to any who generously lend their aid.

Let each observer keep a daily record, and note at the time the following points:

1. The date of observation.
2. The name of the plant, and whether common or rare in the district.
3. The number of bees working, whether few or many.
4. The material gathered, whether honey, pollen, or propolis.
5. The yield, whether scanty or abundant, and its duration.
6. Any other facts of special interest.

Every plant on which the bees work, whether it be well known or little known, whether cultivated or indigenous, should be chronicled. There should be no exception; although indigenous species require the more careful scrutiny, since we know less of their honey-bearing qualities, and the bee in the wild state finds in them its only source of supplies.

If the plant be unknown to the observer, or doubtful, let him dry a flowering branch with a few leaves, in a book or between sheets of paper, append a label with the date and a number in his journal, and forward it to us with that journal, at the close of the season.

The yield of honey in any case may be determined, by killing a bee and examining the honey-bag; the yield of pollen, by the accumulation on the legs. The color of the honey or pollen gathered from different plants, should also be noted.

Attention should likewise be directed to the various colonies of aphides or plant-lice; and the fact noted, if bees visit them to sip the nectarous exudation which they deposit on the leaves or branches.

The occurrence of honey-dew on the leaves of various trees and plants, and if preceded or attended by any striking meteorological phenomena, should be noted.

Inquiry might also be made as to *poisonous honey*, or rather if bees are ever seen on the blossoms of the *Kalmia*, *Rhododendron*, or *Rhus vernix*. A viscid substance has been observed on the blossoms of the *Kalmia latifolia*. Might not bees, under the pressure of necessity, collect it for propolis?

TERMS OF THE BEE JOURNAL:

Single Copy, - - - One Dollar.

Five Copies, - - - Four Dollars.

Ten or more copies, Seventy-five cents each.

Each Dollar Subscriber will receive a prepaid copy of either the "*Year Book of the Farm and Garden*," or of "*Both Sides of the Grape Question*," as a premium



AMERICAN BEE JOURNAL.

Philadelphia, April, 1861.

TO CORRESPONDENTS.

We have received several communications relative to the Dzierzon theory and the Baron of Berlepsch's exposition of it, which we prefer *holding over* for the present. When the Baron commenced his series of letters, he requested all those whose views or convictions differed from his own, to withhold comments till his self-imposed task was finished. He would then, he said, be ready to take up any topics which they might present for discussion, after having obtained a clear view of the entire field. We think it will be advantageous to adopt the same course now; particularly as it will involve only a brief delay, and may save some of our correspondents from being committed to views which they may subsequently desire to modify or withdraw. We design that all shall have a fair hearing; and shall regard all unrecalled communications, as presenting the unchanged sentiments of the writers.

There is an additional reason for this course. A full account of the Dzierzon theory is expected by our readers, and must be given. It will necessarily occupy a considerable portion of our columns for several months yet. To take up more of our space, simultaneously with the further discussion of the same topics, would prevent us from giving that variety which is likewise looked for in our pages, and which it is by no means easy to secure in a publication devoted, like the *Bee Journal*, to a speciality.

REMITTANCES.

Those who wish to remit money for subscriptions are respectfully requested to observe the following suggestions:—

Give the Name, Post Office, County and State in full. Write them so plainly that they can be read with ease.

In sending money we prefer gold. Gold dollars can be sent with safety, if fastened to the letter sheet by having a small piece of paper glued or pasted over them.

The notes of all solvent banks will be taken for subscriptions.

Thanks to our friends for the many large lists of beekeepers' names sent us, and we request them to continue sending.

Monthly Management.

APRIL.

This month furnishes the bees with increasing opportunities for gathering pollen; and in districts especially where willows, maples, and alders are plenty, they usually collect and garner large quantities of this article, so important for their own sustenance and the nourishment of their brood. Now, when the weather becomes settled and fair, and the workers are returning in crowds with pellets on their thighs, is the proper time for pruning the combs. Some beekeepers object to all pruning at this season, while others recommend a free use of the knife, but the judicious operator must be governed by the circumstances by which he is surrounded. The weather in this month is proverbially variable, and we not unfrequently find "winter lingering in the lap of May," and the safer course, therefore, will probably be to avoid extremes, by removing only such portions of the combs as have become mouldy or damaged, or are ill-placed, or are from any cause unserviceable. New and clean comb, containing worker cells exclusively, should be allowed to remain; and such box or basket hives as are low in shape, and thus have short combs, will consequently need little more dressing than a slight trimming of the edges and the removal of the droppings from the bottom board. Colonies whose bees are seemingly indolent, may be stimulated to action by more liberal pruning, and if no brood can be seen in the worker cells, and the cut edges of the combs are not speedily dressed, we may infer either that such colony is queenless, or that its queen is diseased or superannuated.

In healthy colonies there is now a regular and constant increase of brood, and consequently a daily increasing consumption of honey. Should a late spring follow a rather open winter, the supply of stores may become so reduced, if not entirely exhausted, as to interfere materially with the rearing of the young, or endanger the existence of the entire stock. Feeding during wet or cold weather, should therefore be resorted to, not to induce more ample egg-laying, but to save the existing brood from destruction, for the bees will occasionally sacrifice it when suffering from or threatened by famine. Sometimes, too, such destruction of the brood is caused by the want of water, which is indispensably necessary for the preparation of the jelly on which the larvæ feed; and this should therefore be furnished to them when the weather does not permit them to go in search of it. In movable comb hives, honey and

water can readily be supplied, by pouring them into empty combs and inserting these near the brooding cluster. The wants of bees in common box or basket hives may be provided for, by shortening the combs something, placing an empty comb flat on the bottom board, after pouring some honey and a few spoonfuls of water in the cells, or laying some candy on the cells containing the water. Care should be taken not to give them more honey in a comb so placed, than they can carry up during the night, especially if the colony is weak, so as not to attract robbers.

Almost every apiary contains some weak colonies in the spring. Where movable comb hives are used, such colonies can be strengthened, by transferring to them from their stronger neighbors, combs containing brood nearly mature. But when they can be procured, it is better to introduce into them a reinforcement of workers from a distant apiary. If these be first well fed with slightly diluted honey, and introduced about dusk in the evening, they will be readily received. Such processes, however, are utterly futile, unless the colony intended to be strengthened has a healthy and fertile queen; and that fact should be ascertained before any further steps are taken. A queenless colony had better be broken up at once, and the bees given to one that has survived the winter in a more favorable condition.

When the bees begin to build new combs, as they usually do about the time when the fruit trees are in blossom, care must be taken to prevent them from building drone-combs in the brooding apartment—unless, for some special purpose, the production of drones be desirable. In movable comb hives, this can be done by removing the frames in which drone-combs have been started, and inserting instead, frames furnished with strips of worker comb. Weak colonies having a fertile queen rarely start drone-combs; and strong colonies manifesting a decided disposition to construct drone-cells, may be brought to a different temper, by repeated removals of bees and brood. It is more difficult to control or counteract the propensities of bees in this particular, if they are kept in common hives; but it may be effected, to some extent, by drumming out and transferring a considerable portion of the workers, and cutting out the drone-combs which have already been built.

The beekeeper's efforts should constantly be directed to the suppression of drone-brood, for, notwithstanding his utmost vigilance, there will be always many more drones produced in his apiary than are needed—unless queen-raising be a principal part of his business. Where honey is the object, he should sedulously foster the rearing of workers, so that, at the favorable moment, when pasturage is abundant, he may have at command a numerous body of energetic laborers, instead of having his hives crowded with a horde of worse than useless consumers.